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09/997,643	11/29/2001	Richard S. Ohran	14113.79	7417
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WORKMAN NYDEGGER (F/K/A WORKMAN NYDEGGER & SEELEY) 60 EAST SOUTH TEMPLE 1000 EAGLE GATE TOWER SALT LAKE CITY, UT 84111			BRADLEY, MATTHEW A	
			ART UNIT	PAPER NUMBER
			2187	

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Please find below and/or attached an Office communication concerning this application or proceeding.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 9 May 2006 has been entered.

Claim Status

Claims 24-53 remain pending and are ready for examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims **24-27** and **53** are rejected under 35 U.S.C. 103(a) as being unpatentable over Watanabe et al (U.S. 6,681,303), hereinafter referred to as Watanabe, in view of Ohran (U.S. 5,835,953), hereinafter referred to as Ohran.

As per independent claim **24**, Watanabe teach,

- receiving information from a user designating first data blocks of the mass storage device to be included in a snapshot copy that is to preserve the designated first data blocks as the designated first data blocks existed at a

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first point in time, wherein the information from the user designates second data blocks of the mass storage device to exclude from the snapshot copy (Column 46 lines 35-39).

Watanabe does not explicitly teach, ensuring that the designated data blocks are in a logically consistent state such that the first point in time corresponds to a time when no activity exists on the mass storage device.

Ohran teaches,

- ensuring that the designated first data blocks are in a logically consistent state such that the first point in time corresponds to a time when no activity exists on the mass storage device; (Column 10 lines 42-54)

Ohran further teaches,

- as the first data blocks at the mass storage device change after the first point in time, identifying specific data blocks of the designated first data blocks that change at the mass storage device, (Column 10 lines 55-64)
- preserving a copy of the specific data blocks of the designated first data blocks that change, wherein the preserved copy of the changed data blocks represents an original copy of said changed data blocks of the designated first data blocks prior to changing; and providing access to the snapshot copy of the designated first data blocks (Column 11 lines 6-20).

Watanabe and Ohran are analogous art because they are from the same problem solving area of data backup.

At the time of invention it would have been obvious to a person of ordinary skill in the art, having both the teachings of Watanabe and Ohran before him/her, to integrate the logically consistent requirement before a snapshot is created of Ohran into Watanabe for the benefit of being sure that no logical inconsistencies are present in the data being copied. It would have also been obvious to implement the partial backup ability of Watanabe into Ohran for the benefit of reducing the amount of data being copied.

The motivation for doing so would have been that, a logically consistent backup copy contains no logical inconsistencies such as data files that are corrupt or terminated improperly (Column 1 lines 60-62 of Ohran). Further, by ensuring that the backup device is in a logically consistent state, the present invention ensures that a useable backup is always available (Column 10 lines 52-54 of Ohran). Additionally, as pertinent to the partial backup, such a method, since only partial area of the logical volume can be subjected to remote copying, it is possible to eliminate unnecessary overhead hitherto caused due to the copying of data the copy of which is not required (Column 4 lines 36-40 of Watanabe).

Therefore it would have been obvious to combine Watanabe with Ohran for the benefit of logical consistency and partial backups to obtain the invention as specified in claims 24-27 and 53.

As per dependent claim **25**, the combination of Watanabe and Ohran teach, wherein the snapshot copy is created without disrupting user access to the designated

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first data blocks to the extent that users are able to continue to issue I/O requests to the mass storage device as the snapshot is created (Column 11 lines 17-20 of Ohran).

As per dependent claim **26**, the combination of Watanabe and Ohran teach, wherein the act of identifying the specific data blocks of the designated data blocks that change at the mass storage device comprises the act of maintaining a table that includes an entry for at least the specific data blocks have changed after the first point in time, (Column 10 lines 60-64 of Ohran).

As per dependent claim **27**, the combination of Watanabe and Ohran teach, further comprising the act of maintaining the snapshot copy as a backup of the designated first data blocks as the designated first data blocks existed at the first point in time, (Column 5 lines 62-67 of Ohran).

As per independent claim **53**, the combination of Watanabe and Ohran teach,

- receiving information identifying first data blocks to include in the snapshot copy and identifying second data blocks to exclude from the snapshot copy; (Column 46 lines 35-39 of Watanabe).
- initiating the creation of a snapshot copy of the first data blocks stored on a mass storage device at a first time when the data blocks are in a logically consistent state on the mass storage device, wherein the snapshot copy initially contains data blocks that are identical to the data blocks at a time prior to the first time; (Column 10 lines 39-41 and Column 10 lines 42-54 of Ohran).

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- during a time period between the first time and a second time, tracking changes to the data blocks of the mass storage device so as to identify which data blocks change in the time period; and (Column 11 line 47 to 51 of Ohran). *The Examiner notes that Ohran teaches a mechanism in place to identify the changes that are made after a first time and a second time.*
- at the second time when the data blocks are in a logically consistent state, initiating an update of the snapshot copy by transmitting only those data blocks that have changed during the time period between the first time and second time to the snapshot copy such that the snapshot copy includes a copy of the data blocks as the data blocks existed on the mass storage device at the second time (Column 11 line 52-64 of Ohran).

Claims **28-52** are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Watanabe and Ohran as applied to claims 24-27 above, and further in view of Armangau (U.S. 6,434,681), hereinafter referred to as Armangau.

The combination of Watanabe and Ohran teach the limitations as noted supra.

The combination of Watanabe and Ohran does not explicitly teach the act of restoring data after a loss of data.

Armangau teach, further comprising the act of restoring the designated first data blocks using the snapshot copy after experiencing data loss at the mass storage system after the first point in time (Column 8 lines 33-37).

The combination of Watanabe and Ohran, and Armangau are analogous art because they are from the same field of endeavor, namely computer backup systems.

At the time of invention it would have been obvious to a person of ordinary skill in the art, having the teachings of Watanabe and Ohran, and Armangau before him/her, to integrate the restoration of data from any previous point in time in Armangau for the benefit of being able to restore data at various points for debugging and testing to compare the files as they change over time.

The motivation for doing so would have been that, for debugging operations such as software simulation and testing, snapshot copies of files of interest can be made at various test points for inspection and comparison at a later time as problems are identified (Column 22 lines 4-9 of Armangau).

Therefore it would have been obvious to combine Watanabe and Ohran, with Armangau for the benefit of being able to recreate the data volumes at any given time to obtain the invention as specified in claims 28-52.

As per dependent claim **29**, the combination of Watanabe, Ohran, and Armangau teach,

- the preserved copy of the changed data blocks for those data blocks of the designated first data blocks that have changed, (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.' With respect to the instant claim, the Examiner notes that the 'preserved copy of the changed data blocks' would be a 'version' as taught by Armangau.*

- original copies of those data blocks of the designated first data blocks that have not changed after the first point in time (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.'* With respect to the instant claim, the Examiner notes that the 'original copies of those data blocks' would be a 'version' as taught by Armangau.

As per dependent claim **30**, the combination of Watanabe, Ohran, and Armangau teach,

- further comprising the act of creating a second snapshot copy of the designated first data blocks as the designated first data blocks existed at a second point in time, (Column 8 lines 15-19 of Armangau). *The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.'* This feature of more than one version, allows the second 'snapshot copy' to be a copy 'as the designated subset existed at a second point in time'.
- as the data blocks at the mass storage device change after the second point in time, and in response to the information, identifying the data blocks of the designated first data blocks that change at the mass storage device, (Column 13 lines 58-65 and elements 127-128 of Figure 7b of Armangau).

- preserving a copy of the data blocks of the designated first data blocks that change after the second point in time, wherein the copy of the changed data blocks represents an original copy of said data blocks of the designated first data blocks prior to changing after the second point in time; and (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.' With respect to the instant claim, the Examiner notes that the 'data blocks of the designated subset that change after the second point in time' would be a 'version' as taught by Armangau.*
- providing access to the second snapshot copy of the designated first data blocks, where in the second snapshot copy includes, (Column 8 lines 33-37 of Armangau). *The Examiner notes that the 'tag' taught by Armangau would designate and differentiate between the stored versions on the secondary storage device allowing for access to the plurality of versions stored on the secondary storage device. Accordingly, the 'tag' allows the system to select the appropriate snapshot copy*
- the preserved copy of the changed data blocks for those data blocks of the designated first data blocks that have changed after the second point in time; (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.' With respect to the instant claim,*

the Examiner notes that the 'preserved copy of the changed data blocks' would be a 'version' as taught by Armangau.

- *original copies of those data blocks of the designated first data blocks that have not changed after the second point in time, (Column 8 lines 15-19 of Armangau). The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.' With respect to the instant claim, the Examiner notes that the 'original copies of those data blocks' would be a 'version' as taught by Armangau.*

As per dependent claim **31**, the combination of Watanabe, Ohran, and Armangau teach, wherein the act of providing access to the snapshot copy comprises the act of permitting a user to change data blocks of the snapshot copy, such that the snapshot copy represents a changed version of the designated subset of the data blocks, (Figure 2 item 92 and Column 9 lines 35-45 of Armangau). *The Examiner notes that in item 92 of figure 2, Armangau teaches a data link from a system manager to the secondary storage system. This data link, further taught in column 9 lines 35-45, allows for 'data storage management' of the secondary storage which would allow for modifications of the copies of data to then be dispersed through items 93 and 94 of figure 2 as needed.*

As per dependent claim **32**, the combination of Watanabe, Ohran, and Armangau teach, wherein the act of providing access to the snapshot copy comprises the act of enabling read access to the snapshot copy, (Column 12 lines 49-60 of Armangau). *The Examiner notes that the 'restore request' received from the 'front-end data mover*

computer' would begin the process of transferring data to the requesting computer. Before the data is moved however, a read command must be issued allowing the data mover 'read access' to select the data being requested from the requesting computer.

As per dependent claim **33**, the combination of Watanabe, Ohran, and Armangau teach, wherein the act of providing access to the snapshot copy is performed while providing ongoing access to the data blocks stored in the mass storage device, (Column 10 lines 33-49 and Column 11 lines 1-11 of Armangau). *The Examiner notes that the secondary storage system as taught by Armangau, contains cache memory which is linked to the 'back-plane busses'. The cache memory contains data that is frequently requested by user computers. Caching the data into the cache memory and allowing the secondary storage system to access the data via a 'back-plane bus' would allow for continued access to the 'data blocks stored' in the secondary storage system while still allowing for access to the snapshot copy.*

As per dependent claim **34**, the combination of Watanabe, Ohran, and Armangau teach, wherein the act of preserving a copy of the data blocks of the designated subset that change is performed by preserving a copy of the data blocks of the designated subset only in response to a first change thereof after the first point in time and not in response to any subsequent changes, (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.' With respect to the instant claim, the Examiner notes that the 'copy of the data blocks' would be a 'version' as taught by Armangau.*

As per independent claim **35**, Watanabe teaches,

- maintaining a snapshot copy of a designated subset of the data blocks stored in the mass storage device, the snapshot copy preserving the designated subset of the data blocks as the designated subset existed at a first point in time without preserving a second subset of the data blocks that are not designated for backup in the snapshot copy and

Watanabe does not explicitly teach logical consistency.

Ohran teach,

- wherein the snapshot copy is created at a time when the designated subset of the data blocks is in a logically consistent state such that no activity is present on the mass storage device, wherein the snapshot copy includes: (Column 10 lines 42-54).

Ohran further teaches,

- preserved copies of those data blocks of the designated subset of the data blocks that have changed at the mass storage device after the first point in time, original copies of those data blocks of the designated subset of the data blocks that have not changed after the first point in time, (Column 10 lines 55-64 and Column 11 lines 6-20).

Ohran and Watanabe do not explicitly teach the act of restoring data after a data loss.

Armangau teach,

- o experiencing loss of at least some of the designated subset of the data blocks at the mass storage device after the first point in time; and restoring the designated subset of the data blocks of the mass storage device using the snapshot copy, (Column 12 lines 49-60). *The Examiner notes that the 'restore request' received from the 'front-end data mover computer' would begin the process of transferring data to the requesting computer. With respect to the instant claim, the restore request would be issued after the requesting computer experienced data loss.*

Watanabe, Ohran, and Armangau are analogous art because they are from the same field of endeavor, namely computer backup systems.

At the time of invention it would have been obvious to a person of ordinary skill in the art, having both the teachings of Watanabe and Ohran before him/her, to integrate the logically consistent requirement before a snapshot is created of Ohran into Watanabe for the benefit of being sure that no logical inconsistencies are present in the data being copied. It would have also been obvious to implement the partial backup ability of Watanabe into Ohran for the benefit of reducing the amount of data being copied.

The motivation for doing so would have been that, a logically consistent backup copy contains no logical inconsistencies such as data files that are corrupt or terminated improperly (Column 1 lines 60-62 of Ohran). Further, by ensuring that the backup device is in a logically consistent state, the present invention ensures that a useable backup is always available (Column 10 lines 52-54 of Ohran). Additionally, as pertinent

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to the partial backup, such a method, since only partial area of the logical volume can be subjected to remote copying, it is possible to eliminate unnecessary overhead hitherto caused due to the copying of data the copy of which is not required (Column 4 lines 36-40 of Watanabe).

Therefore it would have been obvious to combine Watanabe with Ohran for the benefit of logical consistency and partial backups.

Further, at the time of invention it would have been obvious to a person of ordinary skill in the art, having the teachings of Watanabe and Ohran, and Armangau before him/her, to integrate the restoration of data from any previous point in time in Armangau for the benefit of being able to restore data at various points for debugging and testing to compare the files as they change over time.

The motivation for doing so would have been that, for debugging operations such as software simulation and testing, snapshot copies of files of interest can be made at various test points for inspection and comparison at a later time as problems are identified (Column 22 lines 4-9 of Armangau).

Therefore it would have been obvious to combine Watanabe and Ohran, with Armangau for the benefit of being able to recreate the data volumes at any given time to obtain the invention as specified in claims 28-52.

As per dependent claim **36**, the combination of Watanabe, Ohran, and Armangau teach, wherein the designated subset has been selected by a user of the computer system (Column 47 lines 34-35 of claim 3 in Watanabe).

As per dependent claim **37**, the combination of Watanabe, Ohran, and Armangau teach, wherein the act of restoring the designated data blocks comprises the act of restoring the designated data blocks to the state in which they existed at the first point in time (Column 8 lines 15-25 and Column 8 lines 33-37 of Armangau). *The Examiner notes that the 'tag' as taught and used by Armangau, would allow the user of the computer system to select the version he or she wishes to restore including restoring the 'designated data blocks to the state in which they existed at the first point in time.'*

As per dependent claim **38**, the combination of Watanabe, Ohran, and Armangau teach, experiencing a condition that results in corruption of said at least some of the designated subset of data blocks; and prior to the corruption of at least some of the designated subset of data blocks, preserving a copy of said at least some of the designated subset, wherein the copy of the changed data blocks represents an original copy of said at least some of data blocks (Column 8 lines 15-19 of Armangau). *The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.' This feature of more than one version, allows a 'copy of the changed data blocks' representing 'an original copy' to be a copy used for restoration.*

As per dependent claim **39**, the combination of Watanabe, Ohran, and Armangau teach,

- as data blocks are stored in the mass storage device, receiving from the user information that identifies the designated subset of the data blocks selected by the user, (Column 8 lines 33-37 of Armangau).

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- as the data blocks at the mass storage device change after the first point in time, and in response to the information, identifying the data blocks of the designated subset that change at the mass storage device; (Column 13 lines 58-65 and elements 127-128 of Figure 7b of Armangau). *The Examiner notes that Armangau teaches a way to identify data blocks that have changed with the recitation of and use of a 'bit map'.*
- preserving the copy of the data blocks of the designated subset that change, wherein the copy of the changed data blocks represents an original copy of said data blocks of the designated subset prior to changing, (Column 8 lines 15-19 of Armangau). *The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.' This feature of more than one version, allows an 'original copy of said data blocks' to be a copy 'of the designated subset prior to changing'.*

As per dependent claim **40**, the combination of Watanabe, Ohran, and Armangau teach, further comprising the act of maintaining one or more other snapshot copies of the designated subset of the data blocks as they existed at the mass storage device at other points in time after the first point in time (Column 8 lines 15-19 of Armangau). *The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.' This feature of more than one version, allows the system to 'maintain one or more other snapshot copies.'*

As per independent claim 41, the combination of Watanabe, Ohran, and Armangau teach,

- receiving an instruction to create a snapshot copy of selected data blocks, wherein second data blocks are not included in the instruction to create a snapshot copy; (Column 46 lines 35-39 of Watanabe).
- comprising the acts of: receiving an instruction to create a snapshot copy of selected data blocks; ensuring that the selected data blocks are in a logically consistent state such that no activity is present regarding at least the selected data blocks; (Column 10 lines 42-54 of Ohran).
- maintaining the snapshot copy the selected data blocks stored in the mass storage device, the snapshot copy preserving the selected data blocks as the selected data blocks existed at a first point in time wherein the snapshot copy includes: (Column 8 lines 15-19 of Armangau). *The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.' This feature of more than one version, allows a first 'snapshot copy' to be a copy 'as the designated subset existed at the first point in time'.*
- preserved copies of those data blocks of the selected data blocks that have changed at the mass storage device after the first point in time; (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.' With respect to the instant claim,*

the Examiner notes that the 'preserved copies of those changed data blocks' would be a 'version' as taught by Armangau.

- original copies of those data blocks of the selected data blocks that have not changed after the first point in time; (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.'* With respect to the instant claim, *the Examiner notes that the 'original copies of those data blocks' would be a 'version' as taught by Armangau.*
- providing access to the snapshot copy of the selected data blocks, such that changes to the snapshot copy do not change the selected data blocks stored on the mass storage device; while providing access to the snapshot copy, providing access to the selected data blocks stored on the mass storage device, such that changes to the selected data blocks stored on the mass device do not change the snapshot copy (Figure 2 item 92 and Column 9 lines 35-45 of Armangau). *The Examiner notes that in item 92 of figure 2, Armangau teaches a data link from a system manager to the secondary storage system. This data link, further taught in Column 9 lines 35-45, allows for 'data storage management' of the secondary storage. This management would allow for changes to the snapshot copies or to changes of other data blocks so as to not interfere with the snapshot copies.*

As per dependent claim **42**, the combination of Watanabe, Ohran, and Armangau teach, wherein the selected data blocks are selected by a user of the computer system, (Column 47 lines 34-35 of claim 3 in Watanabe).

As per dependent claim **43**, the combination of Watanabe, Ohran, and Armangau teach, wherein the act of providing access to the snapshot copy comprises the act of providing write access to the snapshot copy by which the data blocks of the snapshot copy can be changed, (Figure 2 item 92 and Column 9 lines 35-45 of Armangau). *The Examiner notes that in item 92 of figure 2, Armangau teaches a data link from a system manager to the secondary storage system. This data link, further taught in column 9 lines 35-45, allows for 'data storage management' of the secondary storage. This management would allow for changes to the snapshot copies.*

As per dependent claim **44**, the combination of Watanabe, Ohran, and Armangau teach,, further comprising the act of maintaining one or more snapshot copies of the selected data blocks as they existed at the mass storage device at other points in time after the first point in time (Column 8 lines 15-19 of Armangau). *The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.' This feature of more than one version, allows the system to perform the act of 'maintaining one or more snapshot copies.'*

As per dependent claim **45**, the combination of Watanabe, Ohran, and Armangau teach,

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- as data blocks are stored in the mass storage device, receiving from the user information that identifies the selected data blocks selected by the user, (Column 8 lines 33-37 of Armangau).
- as the data blocks at the mass storage device change after the first point in time, and in response to the information, identifying the data blocks of the selected data blocks that change at the mass storage device; (Column 13 lines 58-65 and elements 127-128 of Figure 7b of Armangau). *The Examiner notes that Armangau teaches a way to identify data blocks that have changed with the recitation of and use of a 'bit map'.*
- preserving the copy of the data blocks of the selected data blocks that change, wherein the copy of the changed data blocks represents an original copy of said data blocks of the selected data blocks prior to changing, (Column 8 lines 15-19 of Armangau). *The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.' This feature of more than one version, allows an 'original copy of said data blocks' to be a copy 'of the designated subset prior to changing'.*

As per independent claim **46**, the combination of Watanabe, Ohran, and Armangau teach,

- maintaining a first snapshot copy of a first designated subset of the data blocks stored in the mass storage device, the snapshot copy preserving the first designated subset of the data blocks as the first designated

subset existed at a first point in time, (Column 8 lines 15-19 of Armangau).

The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.' This feature of more than one version, allows a first 'snapshot copy' to be a copy 'as the designated subset existed at the first point in time'.

- wherein the first snapshot copy is created at a first time when the designated subset of data blocks is in a logically consistent state such that no activity is present in the mass storage device, and (Column 10 lines 42-54 of Ohran).
- wherein a particular subset of the data blocks stored in the mass storage device are not designated for backup in the snapshot copy, (Column 46 lines 35-39 of Watanabe).
- wherein the first snapshot copy includes, preserved copies of those data blocks of the subset of first designated data blocks that have changed at the mass storage device after the first point in time; and original copies of those data blocks of the first designated subset of the data blocks that have not changed after the first point in time; (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain 'more than one version of backup data.' With respect to the instant claim, the Examiner notes that 'original copies of those data blocks' would be a 'version' as taught by Armangau.*

- maintaining a second snapshot copy of a second designated subset of the data blocks stored in the mass storage device, the snapshot copy preserving the second designated subset of the data blocks as the second designated subset existed at a second point in time, (Column 8 lines 15-19 of Armangau). *The Examiner notes that Armangau teaches the feature of containing 'more than one version of backup data.' This feature of more than one version, allows a first 'snapshot copy' to be a copy 'as the designated subset existed at the first point in time'.*
- wherein the second snapshot copy is created at a second time when the designated subset of data blocks is in a logically consistent state such that no activity is present in the mass storage device, and (Column 10 lines 42-54 of Ohran).
- wherein another subset of data blocks stored in the mass storage device are excluded from backup in the second snapshot copy (Column 46 lines 35-39 of Watanabe).
- wherein the second snapshot copy includes, preserved copies of those data blocks of the subset of second designated data blocks that have changed at the mass storage device after the second point in time; and original copies of those data blocks of the second designated subset of the data blocks that have not changed after the second point in time; (Column 8 lines 15-19 of Armangau). *The Examiner notes that as discussed supra, the secondary storage system of Armangau can contain*

'more than one version of backup data.' With respect to the instant claim, the Examiner notes that 'preserved copies of those data blocks of the second designated subset of the data blocks' would be a 'version' as taught by Armangau.

As per dependent claim **47**, the combination of Watanabe, Ohran, and Armangau teach, wherein the first designated subset and the second designated subset are selected by a user of the computer system (Column 47 lines 34-35 of claim 3 in Watanabe).

As per dependent claim **48**, the combination of Watanabe, Ohran, and Armangau teach, further comprising the act of providing access to the first snapshot copy of the first designated subset of the data blocks while independently providing access to the data blocks stored on the mass storage device, (Column 10 lines 33-49 and Column 11 lines 1-11 of Armangau). *The Examiner notes that the secondary storage system as taught by Armangau, contains cache memory which is linked to the 'back-plane busses'. The cache memory contains data that is frequently requested by user computers. Caching the data into the cache memory and allowing the secondary storage system to access the data via a 'back-plane bus' would allow for continued access to the 'data blocks stored' in the secondary storage system while still allowing for access to a snapshot copy.*

As per dependent claim **49**, the combination of Watanabe, Ohran, and Armangau teach, wherein the first period of time is different from the second period of time, (Column 8 lines 15-19 and 33-37 of Armangau).

As per dependent claim **50**, the combination of Watanabe, Ohran, and Armangau teach, wherein the first designated subset of the data blocks is different from the second designated subset of the data blocks, (Column 8 lines 15-19 and 33-37 of Armangau).

As per dependent claim **51**, the combination of Watanabe, Ohran, and Armangau teach, further comprising the act of maintaining the first and second snapshot copies as backups of the first and second designated subsets of the data blocks, respectively (Column 8 lines 15-25 and 33-37 of Armangau).

As per dependent claim **52**, the combination of Watanabe, Ohran, and Armangau teach, further comprising the act of restoring the first designated subset of the data blocks using the first snapshot copy after experiencing data loss at the mass storage system, (Column 8 lines 33-37 and Column 12 lines 49-60 of Armangau). *The Examiner notes that the 'restore request' received from the 'front-end data mover computer' would begin the process of transferring data to the requesting computer. With respect to the instant claim, the restore request would be issued after the requesting computer experienced data loss. The restore request would contain the 'tag' to ensure the 'first snapshot copy' was the copy being restored.*

Response to Arguments

Applicant's arguments have been carefully and fully considered but are moot in view of the new ground(s) of rejection.

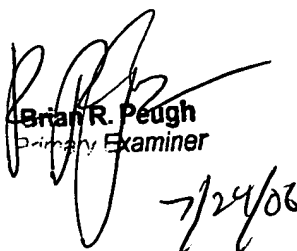
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew Bradley whose telephone number is (571) 272-8575. The examiner can normally be reached on 6:30-3:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A. Sparks can be reached on (571) 272-4201. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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BRP/mb



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7/24/06